

the cooling tube includes a one-piece extrusion forming the plurality of flow passages; and  
the at least one external heat exchange surface is a heat exchange surface of a fin attached to the one-piece extrusion.

9. The machine system of claim 8 wherein the cooling tube is one of a plurality of interchangeable cooling tubes supported in the header, and the pack seal is one of a plurality of interchangeable pack seals for the plurality of interchangeable cooling tubes, and wherein the cooler further includes a fan structured to produce the flow of cooling air to exchange heat with compressed air conveyed through the plurality of interchangeable cooling tubes.

10. An air-to-air aftercooler (ATAAC) for an intake system in an internal combustion engine comprising:  
an inlet tank having a compressed air inlet;  
an outlet tank having a cooled air outlet;  
a header attached to the inlet tank and having an inlet header side, and a second header side opposite to the inlet header side;  
a cooling tube including an inlet tube end supported in the header and opening to the inlet tank and an outlet tube end opening to the outlet tank;  
the cooling tube includes at least one heat exchange surface exposed to a flow of cooling air between the inlet tube end and the outlet tube end;  
a pack seal extending peripherally around the cooling tube; and  
a clamping assembly coupled to the second header side and clamping the pack seal against the header, such that the pack seal is squeezed into sealing contact with each of the cooling tube and the header.

11. The ATAAC of claim 10 wherein the clamping assembly includes a clamping plate, and a seal retainer sandwiched between the clamping plate and the pack seal.

12. The ATAAC of claim 11 wherein a seal cavity is formed in the header and the pack seal and the seal retainer are each positioned within the seal cavity.

13. The ATAAC of claim 12 wherein the clamping assembly includes a clamping plate and a plurality of clamping bolts received in the header.

14. The ATAAC of claim 11 wherein clearances are formed between the cooling tube and the clamping plate and between the cooling tube and the header, and are from 4 mm to 12 mm.

15. The ATAAC of claim 13 wherein the clearance between the cooling tube and the clamping plate is approximately 8 mm.

16. The ATAAC of claim 10 wherein:

a plurality of flow passages are formed by the cooling tube;

the cooling tube is one of a plurality of interchangeable cooling tubes each including a one-piece extrusion and a cooling fin attached to the one-piece extrusion; and  
the ATAAC further includes a fan structured to blow cooling air across the cooling fins.

17. A header assembly for an air-to-air aftercooler (ATAAC) comprising:

a header having an inlet header side structured for coupling with an inlet tank, and a second header side opposite to the inlet header side, a plurality of tube openings extending between the inlet header side and the second header side, and a plurality of seal cavities in communication with the plurality of tube openings;

a plurality of cooling tubes supported in the header within the plurality of tube openings;

a plurality of pack seals positioned within the plurality of seal cavities; and

a clamping assembly coupled to the second header side and clamping the plurality of pack seals against the header, such that the plurality of pack seals are squeezed into sealing contact with the plurality of cooling tubes and the header.

18. The header assembly of claim 17 wherein the clamping assembly includes a clamping plate having another plurality of tube openings formed therein and receiving the plurality of cooling tubes, and a plurality of seal retainers sandwiched between the clamping plate and the plurality of pack seals.

19. The header assembly of claim 18 wherein the clamping assembly further includes clamping bolts received in the header.

20. The header assembly of claim 18 wherein smaller clearances are formed between the plurality of seal retainers and the plurality of cooling tubes, and larger clearances are formed between the header and the plurality of cooling tubes and between the clamping plate and the plurality of cooling tubes.

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